

Public Sector Energy Management and Energy Efficient Procurement Workshop

Date: September 20, 2005

Time: 09:30 to 18:00 hrs

Venue: Sahyadri State Guest House, Mumbai

Organizers: Public Works Department (PWD) – Government of Maharashtra, Maharashtra Energy Development Agency (MEDA), United States Environmental Protection Agency (US-EPA), United States Agency for International Development (USAID), International Institute for Energy Conservation (IIEC), Lawrence Berkeley National Laboratory (LBNL)

Public Sector Energy Management Workshop:

Objectives

- Help reduce the gap between electricity demand and supply by learning to implement no- or low-cost energy conservation opportunities at public-sector facilities.
- Gain a better understanding of energy analysis tools for Public-sector buildings.
- Learn about some new energy efficient technologies and their potential applications.
- Learn about low- and no-cost energy conservation strategy
- Learn to identify sites for retrofit projects through simple benchmarking and utility bill accounting techniques

Summary

"These workshops were jointly hosted by MEDA and PWD with support from USAID India Mission and US Environmental Protection Agency to LBNL and IIEC under the PEPS and Energy Conservation and Commercialization (ECO-II) initiatives. MEDA and PWD helped identify the energy efficiency initiatives in the public sector buildings based on the Strategic Energy Conservation Action Plan created under ECO II initiative and the LBNL study reflecting the link between energy conservation in key sectors including public buildings and the resulting benefits to the state exchequer."

The meeting opened with introductions by Mr. Chaudari of the Maharashtra Energy Development Agency (MEDA), Mr. Kawale of the Maharashtra Public Works Department (PWD) the two host organizations. Both stressed the importance of saving energy in Maharashtra and the emphasis on public buildings as an early priority. Both also provided convincing documentation of their organization's commitment to this and to the goals of the workshops.

Mr. S. Padmanabhan, of USAID/India made an opening address that set the broad policy context for the public sector energy management work in Maharashtra. He indicated that up to now, states have not had conservation strategy but the focus has been on supply side management. Efficiency improvement is now being seen as an important strategy to bridge gap between demand and supply. Efficiency improvement can also help reduce government's fiscal deficit as shown in a Lawrence Berkeley National Laboratory (LBNL) study last year that found the fiscal deficit could be reduced by 18-42%.

He further stressed that there is an important need now to strengthen state conservation strategy. Maharashtra can be a leading model. It is developing a strategic energy conservation plan for the state. In implementing this plan, the Energy Secretary has identified EE in public buildings as an initial priority. This can demonstrate a leadership role to be played by Government to promote energy conservation.

In the public buildings program it is important to pursue low cost / no cost measures immediately on a mass scale and to establish a credible system for monitoring and verification (M & V). In addition, at least one demonstration project involving more significant investment should be done quickly in the state. In parallel, attention should be focused on creation of guarantee funds to cover risk in EE projects, so that demonstrations could be replicated in the future.

Paul Schwengels of the US. Environmental Protection Agency (EPA) briefly highlighted the potential for energy savings in the public sector and the overall approach of the public buildings partnership among EPA, USAID, LBNL, BEE, MEDA and PWD.

Satish Kumar of Lawrence Berkeley National Laboratory (LBNL) presented an overview of US and international materials on education and awareness campaigns to promote energy efficiency in public buildings. He also summarized two case studies under development documenting successful low cost/no cost energy efficiency campaigns in Mumbai – JJ Hospital and the Maharashtra State Electricity Board (MSEB) building. These case studies included many of the elements of successful education and awareness campaigns identified in international materials. In the JJ Hospital case, improvements in operation and awareness of employees, with no capital investment, resulted in significant savings (Rs. 38.5 Lakhs or approx. \$90,000) in three years. The MSEB effort, including both improved operations and awareness and low cost lighting retrofits, resulted in savings of over 20% of total building electricity use.

Mr. Hemant Patil of PWD presented an overview of PWD's energy efficiency activities including results of energy saving retrofit programs in two PWD managed buildings from 2001-2004. These programs saved considerable energy and all had simple paybacks of less than 3 years. Additional efficiency programs in 6 buildings in 2004-5 achieved savings ranging from 10-23% of electricity consumption. PWD has identified a range of efficient technologies including lighting, air conditioning, water heating and cooling, water pumping, variable speed drives and ceiling fans, that have wide potential application for PWD buildings. Mr. Patil presented estimates of expected savings from retrofit of these technologies across 17 of the PWD managed buildings. Notably, PWD proposals include reduced energy intensity of lighting in these buildings by up to 30%, and improvements in efficiency of window and split AC systems.

5 buildings, with loads greater than 500 kVA, have been identified as pilot sites for a proposed “Build Operate and Transfer (BOT)” procurement. The proposed BOT arrangement is similar in many ways to energy service performance contracts (EPSC) used in the US and elsewhere.

During discussion participants noted that PWD has done a lot of work to define cost-effective energy efficiency investment opportunities in many state government buildings but has been able to access the financing needed to implement only a few. The Public Buildings Partnership is seen as one avenue to promote greater attention and support for these projects at high levels in the state government.

It was also pointed out that the education and awareness, and other low cost/no cost measures could achieve significant additional savings very quickly if implemented broadly in state government buildings. The Public Buildings Partnership is working to promote both low cost/no cost measure and capital investment projects in parallel.

Satish Kumar (LBNL) gave a presentation on Lighting Technology & Practices. He clarified a number of different indices of lighting quality, lighting levels, and energy performance – e.g., lighting efficacy, lumen depreciation – used to compare alternative technologies. He noted that lighting quality, e.g., color temperature and color rendering index (CRI) should also be considered while considering EE improvement, in order to ensure that the products will satisfy users. He also reviewed a range of currently available technologies against some of these criteria. Dr. Kumar also reviewed information available from the US and elsewhere on best operation and maintenance (O & M) practice for window air conditioners, including operating in “fan saver” mode which reduces energy consumption and also humidity limiting entrainment and re-evaporation of condensed water from the inside coil, as well as other simple cleaning and operating practices.

In discussion participants raised questions on recycling or disposal practices of lamps and products containing hazardous substances such as lead or mercury. This is an issue that needs more attention in India, as in many other countries.

Mr. Shishir Athale of Sudnya Industrial Services PVT., Ltd., made a presentation on behalf of IIEC-implemented ECO II initiative on “Standard Energy Audit Manual”. The presentation, prepared with input from Mahesh Patankar of IIEC, provided an outline of the draft manual under development of establish standard scopes and content for audits. The objective is to improve quality and consistency of audits.

Questions and discussions pointed out the need to define and include different types and levels of detail for audits in an overall common framework. Different types of audits serve different purposes and require different levels of detail and information. Audit types include simple walk through, diagnostic audits, partial systems versus comprehensive audits. The objectives of the audit may range from identification of interim measures, development of an investment grade proposal, benchmarking for comparison/monitoring and verification purposes, sequencing of energy efficiency measure, etc. The objectives should drive the scope and level of detail of the audit. For all of these different levels of audits, it is still useful to have a consistent framework for data collection and reporting. The effort underway in Maharashtra needs to be coordinated

with BEE and other key organizations to help formulate a consistent approach to conducting building energy audits. This will help with broad macro level benchmarking in the public building sector as well as providing a higher level of confidence to the ESCOs on the technical content and accuracy of the audit report and thus help avoid or reduce the cost of multiple audits of the same facility.

Separate guidelines are needed for preliminary / walkthrough audits and detailed energy audit. It was also suggested that all audits need to address baseline issues in a credible way. Also, it may be more efficient to focus on A/C & lighting for many building types. It is not urgent to cover all the areas in detail if 70-80% of consumption is by lighting and air-conditioning.

In the final discussion, participant recommended that meetings/training and info sharing on government energy management need to be continued periodically. One meeting was useful, but an ongoing effort is needed to make real progress. Future meetings could include more specific technical training – e.g., use of the standard audit manual, benchmarking. In addition, a major theme of the next round should be “moving from audits to implementation”. Along with improving the quality and consistency of audits, it is important to ensure that they lead to actual implementation. More emphasis is needed on financing and implementation of investment projects in the public sector.

Workshop on Energy Efficient Procurement for Government Agencies

Objectives

- Explore the possibility of establishing a cross-cutting policy and set of general specs to help the government achieve scale economies through big purchasers and help reduce transactions costs through standardization.
- Help improve the quality of lighting products being procured by government agencies.
- Identify the vehicle/instrument that would make bulk procurement of energy efficient lighting products possible either at the state level or within one organization.
- Discuss appropriate lighting products that may be suitable for this initiative e.g. lamp/ballast combination, lighting fixtures (luminaries), CFLs, others. Discuss the strategy for setting the energy efficiency levels of lighting products by building on the work done by BEE and others in this area. Discuss possible specifications and procedures that could be adapted from US or other experience (ELI?)
- Explore the possibility of tying this initiative with a government organization that is committed to implementing the recommendations in both existing buildings (through lighting retrofits) and in new buildings. Candidates are Maharashtra Public Works Department, Reserve bank of India, Central or Western Railway, Indian Institute of Technology, Mumbai, Indian Oil Corporation Limited.

Summary

An opening presentation by Paul Schwengels of USEPA reviewed some international experience– US FEMP and China – with government procurement programs, benefits and lessons learned.

Mr. Shyam Sujan of the Electric Lamp and Component Manufacturers' Association of India (ELCOMA) discussed many of the activities undertaken by industry in partnership with government. There is general agreement that the most effective and practical solutions to achieve immediate relief and reduction in the peak load demand is to replace:

- GLS lamps with CFLs
- 40W fluorescent tubes with 36 or 28W tubes, and
- magnetic ballasts with electronic ballasts

He reviewed a number of government and industry actions to promote these technologies. ELCOMA and the Government of India are also engaged in the international effort to harmonize standards for CFLs.

Satish Kumar presented examples of technical specifications for fluorescent tubes and ballasts used by the US FEMP, the China program and the World Bank/International Finance Corporation (WB/IFC) Efficient Lighting Initiative (ELI) as background for discussion of specifications for a possible bulk procurement in Maharashtra.

Mr. S. Ramaswamy, of the Bureau of Energy Efficiency (BEE) covered recommendations developed by BEE for FTLs, electronic ballasts and luminaires and provided to the Central PWD

He recommended that the State of Maharashtra and other interested organizations use these lighting procurement specifications. He also discussed proposed labeling specifications for fluorescent tubes and recommendations under development for CFLs. Mr. Ramaswamy made a strong case for the use of life cycle cost (LCC) based procurement practice instead of lowest first cost basis for procurement. He also discussed the BESCO model of CFL promotion in Bangalore and recommended this for Maharashtra for DSM programs.

Discussions

Workshop participants noted the difficulties inherent in the complicated specification and procurement processes in Maharashtra and central government. Several organizations at different levels of government have important roles in the procurement process. These include the Directorate General for Supplies and Disposals (DGSND) in Delhi, the Bureau of Indian Standards (BIS), the Directorate of Industry for Maharashtra, the Maharashtra PWD Chief Engineer, and PWD Division stores. None of these appears to include significant energy efficiency requirements. There seems to be a general consensus that significant potential exists in the lighting area for energy efficient procurement but that policy guidance must come from high levels in the Maharashtra State Government in order to have a significant and rapid effect. We heard, for example, that the Chief Minister had previously issued a Government Regulation (GR) requiring the use of CFLs to replace GLS bulbs in government buildings and that this has been rapidly implemented. There seems to be strong interest among government and lighting industry representatives in finding ways to improve the energy efficiency of lighting (and other equipment) in government buildings.

Concerns were raised about mercury contained in lighting products and disposal/recycling programs. None of the industry and government participants were able to identify any solutions to this concern. The partnership will investigate best practices and information from other countries for consideration in the Indian context.

There was considerable discussion of lifetime guarantees for lighting products – lamps and ballasts. ELCOMA and industry representatives indicated that manufacturers offer 1 year guarantees for CFLs. Government representatives suggested that as the bulbs are advertised to last several years, why not offer longer guarantees? The industry response is that they can't be sure that a particular bulb is not being used 24 hours a day 7 days a week, and thus only last one year. There seemed to be room for further discussion and possible compromise on this issue in the public building context.

Some participants raised questions about the effect of compact fluorescent lights and electronic ballasts on power factors and harmonic distortion in buildings. Others felt that the contribution of lighting products was likely to be small and could be addressed in other ways. There is clearly some need for clear understanding of these issues and the variability of products in the market. Possibly specifications for performance may need to include these issues.

There was a lot of discussion of CFL programs and specifications. This is not the initial focus of the energy efficient procurement effort, but this may be an area for future work.

There was a general sentiment expressed by participants that there should be meeting like this on a continuing basis to discuss and refine approaches to procurement, and to coordinate with national and private sector efforts.

List of Attendees on the next page ...

List of Workshop Attendees

Name & Designation	Address	Ph.No./E-mail
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